



Early adolescence behavior problems and timing of poverty during childhood: A comparison of lifecourse models



Julia Rachel S.E. Mazza^{a,*}, Jean Lambert^a, Maria Victoria Zunzunegui^a,
Richard E. Tremblay^{b,c}, Michel Boivin^{d,e}, Sylvana M. Côté^{a,f}

^a Department of Social and Preventive Medicine, University of Montreal, Montreal, H3N 1X9, Canada

^b Department of Psychology, University of Montreal, Montreal, H2V 2S9, Canada

^c School of Public Health, Physiotherapy and Population Science, University College Dublin, Belfield, Dublin 4, Ireland

^d School of Psychology, University of Laval, Quebec, G1V 0A6, Canada

^e Institute of Genetic, Neurobiological, and Social Foundations of Child Development, Tomsk State University, Tomsk, 634050, Russian Federation

^f INSERM, U1219 Bordeaux, University of Bordeaux, Bordeaux, 33076, France

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ABSTRACT

Context: Poverty is a well-established risk factor for the development of behavior problems, yet little is known about how timing of exposure to childhood poverty relates to behavior problems in early adolescence.

Objective: To examine the differential effects of the timing of poverty between birth and late childhood on behavior problems in early adolescence by modeling lifecourse models, corresponding to sensitive periods, accumulation of risk and social mobility models.

Methods: We used the Quebec Longitudinal Study of Child Development (N = 2120). Poverty was defined as living below the low-income thresholds defined by Statistics Canada and grouped into three time periods: between ages 0–3 years, 5–7 years, and 8–12 years. Main outcomes were teacher's report of hyperactivity, opposition and physical aggression at age 13 years. Structured linear regression analyses were conducted to estimate the contribution of poverty during the three selected time periods to behavior problems. Partial F-tests were used to compare nested lifecourse models to a full saturated model (all poverty main effects and possible interactions).

Results: Families who experienced poverty at all time periods were 9.3% of the original sample. Those who were poor at least one time period were 39.2%. The accumulation of risk model was the best fitting model for hyperactivity and opposition. The risk for physical aggression problems was associated only to poverty between 0 and 3 years supporting the sensitive period.

Conclusion: Early and prolonged exposure to childhood poverty predicted higher levels of behavior problems in early adolescence. Antipoverty policies targeting the first years of life and long term support to pregnant women living in poverty are likely to reduce behavior problems in early adolescence.

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1. Introduction

Poverty has been associated to behavior problems during childhood and adolescence in many regions of the developed world, including North America and Europe (Russell et al., 2014; Shaw et al., 2005). However, it remains unclear whether behavior problems in adolescence are more likely because of exposure to

poverty during certain periods of childhood, or whether it is a matter of prolonged exposure over the years. This study is grounded in the lifecourse framework (Lynch and Smith, 2005) which describes how exposure to adversity throughout the lifecycle relates to disease risk later in life. Several lifecourse models have been proposed (Kuh et al., 2003; Hallqvist et al., 2004) and correspond to: (1) the sensitive period model describing a time period when exposure has a stronger effect on disease risk than it would at another times; (2) the accumulation of risk model asserting that exposure accumulates overtime increasing disease risk; and (3) the social mobility model proposing that instability in exposure

* Corresponding author. UHC Ste Justine, 3175, chemin de la Côte Sainte-Catherine, Bloc 5, room A571, Montreal, QC, H3T 1C5, Canada.

E-mail address: julia.rachel.sampaio.elsesbao@umontreal.ca (J.R.S.E. Mazza).

overtime leads to disease occurrence. The current paper examined the timing and duration of childhood poverty in association with three subtypes of behavior problems that are prevalent in adolescence (Polanczyk et al., 2015): hyperactivity, opposition, and physical aggression.

1.1. Poverty and behavior problems: A lifecourse approach

Numerous studies have addressed lifecourse poverty in relation to behavior problems across development using a variety of research methods. There is evidence that the adverse prenatal environment and earliest years of life constitute a sensitive period for the development of later-life behavior problems (Côté et al., 2006; Pingault et al., 2013). Other studies support the accumulation of risk model which states that poverty and low income effects accumulate in childhood and lead to behavior problems in adolescence (McLaughlin et al., 2011; Rekker et al., 2015). However, there is little evidence simultaneously examining different lifecourse models of adversity relative to behavior problems. Of the few studies which have examined these models, the evidence is mixed. An Australian study showed that exposure to maternal depression was more important at age 2 years than exposure later in life or time spent in poverty in explaining aggressive and delinquent problems at age 9.5 years (Giles et al., 2011). Despite the fact that this study did not consider poverty as its measure of adversity (but rather maternal depression), it demonstrated early childhood (i.e. before age 5 years) as a sensitive period of adversity for behavior problems while considering other lifecourse processes such as accumulation of risk and social mobility. This study is particularly interesting as it reported results using a model-building framework to test for several competing lifecourse models (Mishra et al., 2009). One study from the United States showed that low income during middle childhood (6–12 years) was associated with behavior problems beyond the effect of low income during early childhood (0–5 years), thus providing evidence of accumulation of risk for behavior problems which in turn was better quantified by middle childhood adversity (Tsal et al., 2005). In this study, timing of exposure to poverty was isolated using accumulation of inputs modeling to test for poverty effects in two distinct points (i.e. early and middle childhood) on behavior problems.

Limitations of these studies should be noted. First, studies yield conflicting results and are limited in terms of comparability due to differences in the analytical strategy used to address lifecourse models. Nor can they be compared in terms of variability in behavioral outcomes and the age distribution of children. Another concern is variation in social policies across high-income countries for which research is available. Second, studies do not rely on annual or biannual measurements of poverty during early and middle childhood years. Repeated and annual measurements allow for the careful control of the timing of exposure to poverty when considering an effect-modification hypothesis, as is required in a lifecourse framework. Finally, few studies have separately examined different subtypes of behavior problems in adolescence (Leis et al., 2013; Nomura et al., 2008). It is important to establish whether lifecourse models of poverty holds across different types of behavior problems or if they are specific to certain subtypes because they have different developmental trajectories and require specific corrective interventions (Tremblay, 2010). Thus, it remains unclear whether the association between childhood poverty and behavior problems in adolescence vary in strength across different periods of time.

1.2. Objectives of the present study

Objectives of the present study were: (1) to model lifecourse models of poverty (0–12 years) corresponding to sensitive periods, accumulation of risk, and mobility models to predict hyperactivity, physical aggression and opposition at 13 years (2) to identify the lifecourse model that best describes the poverty-behavior problem link. We apply a structured modeling approach (Mishra et al., 2009) as a model-building framework. Based on this approach, nested lifecourse models of poverty in relation to behavior problems are contrasted to a saturated model, an all-inclusive model with as many poverty parameters as there are possible sequences of exposure, to assess which model is most consistent with the data. We hypothesized that prolonged exposure to childhood poverty and possibly exposure during sensitive periods, such as the early childhood (i.e. before age 5 years), would increase behavior problems in early adolescence. We also hypothesized that the identification of lifecourse models would differ across subtypes of behavior problems due to variations of behavior problems trajectories overtime. In addition, the distinct contribution of the study resides in examining the role of timing and duration as well as intermittent exposure to childhood poverty underlying the development of behavior problems in early adolescence.

2. Methodology

2.1. Data

Data originated from the Quebec Longitudinal Study of Child Development (QLSCD) collected between 1998 and 2011. The target population was children born in 1997–1998 and whose mothers resided in Quebec, Canada (Jetté and Groseilliers, 2000). The initial sample comprised of 2120 children aged 3–8 months (mean age 5 months). Data were collected yearly until 2006 when the interview schedule shifted to a biennial design. Interviews were conducted by trained research assistants through home interviews and directed to the person most knowledgeable about the child (mothers in 98% of cases). Written informed consent was obtained from all respondents. We used 12 assessments points at ages: 5 months, 1½, 2½, 3½, 4½, 5, 6, 7, 8, 10, 12, and 13 years. When participants were 13 years of age, 1290 participants from the initial sample remained in the study (i.e. 60.8% retention rate), of which a total of 983 had nonmissing values on at least one of the three subtypes of behavior problems. The characteristics of the QLSCD sample present at 13 years of age and sub-sample with missing data are presented in the Appendix (see Table S1).

2.2. Attrition and non-participation

QLSCD retention rate was high until children aged 4.5 years (92%) with attrition increasing afterwards. By age 13, attrition was nearly 40%. The highest attrition rates were observed for respondents living in poverty, with a high school diploma or less, as well as being in single-parent and immigrant families. Specifically, the proportion of participants exposed to poverty at 5 months of age was 24.1% but only 11.9% using the active or complete case sample at age 13 years, which in turn indicates differential study attrition. Table 1 presents remaining participants in the QLSCD over sampling period by exposure to poverty.

2.3. Measures

Behavior problems. Teachers rated participants' behavior problems at 13 years of age using the early childhood behavior scale from the Canadian National Longitudinal Study of Children and

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